

NCACI vs Conventional Consultancies: A Humanity-First Framework under Radhika BuildScience

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Abstract

The **National Centre for Applied Civil Innovation (NCACI)** represents a transformative framework under Radhika BuildScience in collaboration with the International Board of Research and Innovation (IBRI). Designed as a comparative model against conventional profit-driven consultancies, NCACI introduces a **humanity-first approach** that integrates research, innovation, documentation, and consultancy within a unified ecosystem. This paper highlights the unique framework of NCACI, emphasizing its mission to combine civil engineering innovations with ethical responsibility and long-term societal benefit.

NCACI's operational structure is built on three interconnected pillars. The first is **knowledge creation**, where innovative models such as StructoPlast™, PhytoCivils™, and reflective pavement systems are developed to address pressing civil and environmental challenges. The second is **knowledge dissemination**, achieved through open-access, DOI-assigned publications that ensure transparency and global visibility. The third is **knowledge application**, where research is translated into consultancy services, field projects, and training initiatives for students, professionals, and communities.

Unlike conventional consultancies that primarily prioritize financial outcomes, NCACI has pledged that up to **90 percent of its future financial surplus will be reinvested into charitable, educational, and community-focused initiatives**. This ensures that every client partnership extends beyond technical service delivery, transforming into an indirect contribution to humanity. By focusing particularly on rural and hilly regions—areas often neglected in mainstream research and consultancy—NCACI positions itself as both inclusive and impactful.

Through its unique vision and mission, NCACI establishes itself as a forward-looking institution. It redefines consultancy not merely as a service but as a social contract—where innovation, academic research, and community upliftment intersect. This humanity-first framework ensures that NCACI will stand as a credible model for future collaborations, inspiring organisations worldwide to align their growth with ethical and charitable commitments.

Keywords

Civil Innovations; StructoPlast™; PhytoCivils™; Reflective Pavements; Sustainable Consultancy; Ethical Framework; Radhika BuildScience; International Board of Research and Innovation (IBRI); Humanity-First Research

Introduction

Civil engineering consultancy has traditionally been driven by two dominant models: academic research laboratories and profit-based private firms. Academic units often remain confined to theoretical exploration and limited experimentation, while private consultancies prioritize financial outcomes and client deliverables, frequently sidelining long-term sustainability and ethical responsibility. This gap has created a pressing need for a new institutional framework that not only generates innovative knowledge but also ensures its dissemination, application, and alignment with societal well-being.

The **National Centre for Applied Civil Innovation (NCACI)**, functioning under Radhika BuildScience in collaboration with the International Board of Research and Innovation (IBRI), was established as a direct response to this gap. NCACI is designed as a hybrid institution that combines research, documentation, open-access publication, and consultancy within a single structure. By introducing unique frameworks such as StructoPlast™, PhytoCivils™, and reflective pavement systems, NCACI addresses both global challenges like climate change and local concerns in rural and hilly regions where infrastructure development is often overlooked.

What makes NCACI distinct is its **humanity-first approach**. Unlike conventional consultancies, NCACI pledges that up to ninety percent of its future financial surplus will be reinvested into charitable, educational, and community-focused initiatives. This transforms every project into more than a transaction—it becomes a social contribution. Clients not only receive tailored technical solutions but also participate indirectly in strengthening society. This integrated model positions NCACI as a forward-looking centre, capable of setting new benchmarks for ethical consultancy and inspiring global collaborations in the field of civil innovations.

Comparative Context

Civil engineering consultancies across the globe have generally followed a conventional pathway that prioritizes profit over long-term social impact. Existing literature indicates that while academic research laboratories contribute knowledge through experiments and publications, their outputs often remain restricted to scholarly circles and seldom translate into actionable frameworks for society. On the other hand, profit-based consultancies operate within a strictly commercial framework, where the primary motive is revenue generation. Although they provide efficient technical services, their engagement with ethical responsibility, open-access dissemination, or community development is often limited.

This creates a **literature gap** in consultancy practice: there are limited examples of institutions that simultaneously balance **innovation, transparency, implementation, and societal benefit**. NCACI emerges as a response to this gap. By embedding research, documentation,

consultancy, and a humanitarian mission into a single model, NCACI introduces a new paradigm for civil innovation. Unlike profit-based consultancies that retain their surplus for organisational growth alone, NCACI has pledged that up to **ninety percent of its financial surplus will be redirected towards charity, education, and community empowerment.**

Such a framework not only differentiates NCACI from existing institutions but also redefines the role of consultancy itself. Every client engaging with NCACI indirectly contributes to public welfare, receiving high-quality solutions while becoming part of a larger social cause. This approach builds a comparative advantage that extends beyond technical expertise—it establishes NCACI as a model where **civil engineering practice intersects with ethical accountability and societal transformation.**

Unique Role of NCACI

The **The National Centre for Applied Civil Innovation (NCACI)** has been conceptualized as a distinctive model that integrates research, publication, and consultancy into a unified framework. Its role extends beyond conventional boundaries, making it both a producer of knowledge and a driver of social transformation.

At the operational level, NCACI functions through a **triple-framework model**. The first dimension is **research and innovation**, where original frameworks such as StructoPlast™, PhytoCivils™, and reflective pavement applications are developed to address contemporary civil engineering challenges. The second dimension is **documentation and dissemination**, where outputs are published as open-access, DOI-assigned research papers, ensuring that innovations are accessible to the global academic and professional community. The third dimension is **consultancy and application**, where knowledge is translated into real-world projects, industry partnerships, and training programs designed for both professionals and students.

What makes NCACI uniquely positioned is its ability to integrate **financial discipline with ethical responsibility**. Unlike profit-based consultancies that direct their revenue solely towards institutional expansion, NCACI pledges to reinvest up to **ninety percent of its future financial surplus into charity, education, and community upliftment**. This humanity-first model ensures that consultancy is not merely a transaction but also a contribution to society. Every client engagement thereby becomes a dual-purpose relationship: solving immediate technical needs while indirectly supporting social welfare initiatives.

By addressing rural and hilly regions—areas that are often excluded from mainstream research and consultancy—NCACI strengthens its inclusive mission. Its focus on underrepresented geographies and its reinvestment into humanity collectively establish NCACI as a **unique institution that bridges innovation with ethical accountability.**

Outcomes and Impact

The establishment of the **National Centre for Applied Civil Innovation (NCACI)** is envisioned to generate outcomes that extend beyond conventional consultancy deliverables. Its model ensures that research, documentation, and social responsibility converge to create measurable impact at multiple levels.

From an academic perspective, NCACI will serve as a **knowledge hub** by producing open-access, DOI-assigned publications on innovative frameworks such as StructoPlast™, PhytoCivils™, Reflective Pavements, Slope Stabilization Models, and **AeroPlast™ Shelters**. These outputs will strengthen the global visibility of Radhika BuildScience and IBRI, while also providing benchmarks for future civil engineering research.

From a professional standpoint, NCACI's consultancy arm will provide **real-world solutions** tailored to the needs of industry, government, and private clients. This includes resilient slope safety strategies, sustainable pavement models, and **lightweight modular infrastructure through AeroPlast™ Shelters, designed for rapid deployment in disaster-prone or resource-limited regions**. Each consultancy project will simultaneously act as a knowledge dissemination channel and a social contribution. Clients will not only receive technical solutions aligned with best practices but will also indirectly participate in strengthening communities, since up to **ninety percent of NCACI's financial surplus will be reinvested into charity and educational initiatives**.

From a societal perspective, NCACI will directly contribute to **capacity building** by organizing workshops, certification programs, and training modules for students, professionals, and local communities. Its special focus on rural and hilly regions ensures that innovation reaches underrepresented areas, empowering them with sustainable infrastructure solutions.

The long-term impact of NCACI lies in its ability to redefine consultancy as a **humanity-first institution**. By combining technical innovation with ethical accountability, it has the potential to inspire new global collaborations, build public trust, and establish itself as a pioneering model for civil engineering research and consultancy in the 21st century.

Comparative Framework: Profit-Based Consultancy vs NCACI

Aspect	Profit-Based Consultancy	NCACI (National Centre for Applied Civil Innovation)
Financial Model	Profit-maximization; surplus retained by firm	No-Profit-No-Loss baseline; 90% of any surplus reinvested into charity, 10% reserved for sustainability
Client Focus	Transactional – deliver project reports/drawings	Dual-purpose – deliver project + create indirect social contribution
Knowledge Sharing	Reports kept proprietary, limited to client	Open-access publications (DOI), global visibility for each innovation
Social Impact	Minimal – limited to direct project scope	High – each project generates parallel benefits for communities (training, shelters, workshops)
Ethical Accountability	Revenue-driven decisions	Humanity-first; ethics embedded in finance + operations
Example (Housing Project)	500 houses designed → ₹50 lakh surplus retained	500 houses designed → ₹10 lakh surplus → ₹9 lakh to charity, ₹1 lakh to research reserve

Extended Hypothetical Case Study: Rural Highway Stabilisation Project

Project Context

A state government approaches two consultancies for the stabilization of a **15 km rural highway stretch in a hilly terrain** prone to landslides. The requirement is slope protection, pavement design, and community awareness for road safety.

Profit-Based Consultancy Approach

- **Deliverable:** Detailed design + slope stabilization drawings.
 - **Project Fee:** ₹2 crore (including consultancy margin).
 - **Surplus Generated:** ₹40 lakh (20% profit margin).
 - **Post-Project Action:** Surplus retained entirely by the firm. No reinvestment into the local community.
 - **Outcome:**
 - Technical solution delivered.
 - Client satisfied.
 - No broader social or educational benefit.
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NCACI Approach (Humanity-First Framework)

- **Deliverable:** Detailed design + slope stabilization using innovative methods (StructoPlast™ reinforcement + PhytoCivils™ vegetation layering).
 - **Project Fee:** ₹1.8 crore (operational cost + minimal service fee).
 - **Surplus Generated:** ₹10 lakh.
 - **Reinvestment Policy:**
 - ₹9 lakh (90%) allocated to **community charity and awareness programs**.
 - ₹1 lakh (10%) retained for NCACI's future research and open-access publications.
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Social Reinvestment Actions by NCACI

- Conducted **5 road safety workshops** in nearby villages (covering 800 participants).

- Constructed **10 AeroPlast™ Shelters** along the highway as emergency cabinets for stranded travelers.
- Published findings as a **DOI-assigned open-access paper**, making innovative methods globally available.

Comparative Results

Impact Area	Profit-Based Consultancy	NCACI
Client Satisfaction	Achieved	Achieved
Innovation	Conventional methods	StructoPlast™ + PhytoCivils™ integration
Knowledge Sharing	Closed reports	DOI-assigned open-access paper
Community Awareness	None	5 workshops, 800 people trained
Charity/Surplus Reinvestment	0%	90% (₹9 lakh)
Societal Benefit	Limited	Free AeroPlast™ Shelters, rural resilience

Case Study Insight

This hypothetical project highlights how NCACI transforms consultancy into a **dual-impact process**. While clients receive world-class solutions at competitive cost, society simultaneously benefits from training, shelters, and open-access knowledge. In this model, consultancy is not merely a technical service—it is a pathway to **collective human advancement**.

Future Roadmap of NCACI

The **National Centre for Applied Civil Innovation (NCACI)** is designed not as a short-term initiative but as a sustainable framework for long-term academic and societal contribution. Its roadmap aligns research, consultancy, and ethics into a structured plan that evolves across phases.

Phase I: Establishment and Knowledge Dissemination (Years 1–5)

In its initial phase, NCACI will prioritize the development of its core research themes, including StructoPlast™, PhytoCivils™, Reflective Pavements, Slope Stabilization Models, and AeroPlast™ Shelters. Outcomes will be documented in the form of **open-access, DOI-assigned publications**, ensuring that the knowledge created is globally visible and replicable. Simultaneously, NCACI will launch small-scale consultancy projects in rural and hilly regions to demonstrate practical applications of its frameworks.

Phase II: Expansion and Collaboration (Years 5–10)

The second phase will focus on **national and international collaborations**. Partnerships with universities, government agencies, and industry bodies will be sought to strengthen research outputs and broaden the scope of applications. Training workshops and certification programs will be scaled to reach larger professional and student communities, ensuring capacity building alongside technical innovation.

Phase III: Global Integration and Ethical Leadership (Years 10–20)

In the long term, NCACI aspires to establish itself as a **global reference centre for ethical consultancy and applied civil innovation**. By operating on its **no-profit-no-loss model** and redirecting up to 90% of surplus income to community development and education, NCACI aims to demonstrate that consultancy can be both technically effective and socially transformative. Its unique humanity-first framework will serve as a comparative model for organisations worldwide that wish to align growth with ethical responsibility.

Long-Term Impact

The roadmap positions NCACI as an institution that not only provides solutions to civil engineering challenges but also redefines consultancy practice itself. By embedding humanitarian values into research and operations, NCACI's long-term vision is to inspire **a new global standard for innovation-driven, ethically accountable civil engineering**.

Ethical Framework in Consultancy Practice

Engineering consultancy has always been more than a technical profession; it is fundamentally tied to ethics, responsibility, and accountability. Globally, professional bodies such as the American Society of Civil Engineers (ASCE) and the Institution of Civil Engineers (ICE) have emphasized that consultants carry not only a duty to their clients but also to the public and the environment. Yet, despite this, consultancy practice in many regions has largely evolved into a profit-centric model where financial margins often outweigh ethical or social considerations.

Historically, the absence of ethical balance in consultancy has led to significant failures. For example, cost-cutting decisions in material quality have been linked with structural collapses, while neglect of environmental considerations has resulted in ecological damage and long-term public risk. These cases reveal a critical gap: when consultancy becomes purely transactional, public safety and social welfare are compromised.

It is within this context that the National Centre for Applied Civil Innovation (NCACI) introduces a new model of practice. Unlike conventional firms that retain profits for institutional expansion, NCACI operates on a no-profit-no-loss principle where sustainability of operations is prioritized over profit. More importantly, any financial surplus is treated not as an organisational gain but as a resource belonging to society. By directing up to ninety percent of surplus into charity, education, and community initiatives, NCACI redefines ethics in consultancy as a structural component of finance and operations, not an optional value.

This ethical model ensures that consultancy outputs are transparent, accountable, and socially valuable. Every client engagement under NCACI becomes part of an ethical cycle: the client receives technically sound solutions, the organisation sustains itself without excessive profit, and society benefits through reinvestment in public good. In doing so, NCACI moves consultancy away from the paradigm of profit and establishes it as a public service embedded in ethics and humanity.

Socio-Economic Impact of the 90% Charity Model

The financial model of the **National Centre for Applied Civil Innovation (NCACI)** is unique in global consultancy practice. By committing to a **no-profit-no-loss baseline** and pledging that **up to 90 percent of surplus income will be redirected to charity, education, and community upliftment**, NCACI transforms consultancy into a mechanism of social

redistribution. This approach ensures that engineering solutions not only serve clients but also generate direct benefits for society at large.

The socio-economic implications of this model can be illustrated through hypothetical projections. Consider that NCACI undertakes **100 consultancy projects over a period of 10 years**. If the total consultancy revenue amounts to ₹100 crore, and a conservative surplus of ₹10 crore is generated, the conventional model would retain the full surplus for internal growth. In contrast, NCACI's framework would allocate ₹9 crore (90 percent) to charitable and community-oriented initiatives while keeping only ₹1 crore (10 percent) for institutional sustainability.

Such reinvestment can have profound impact. For example:

- **Education:** ₹3 crore could fund scholarships, technical workshops, and capacity-building programs for rural students in civil engineering.
- **Shelters and Relief:** ₹2 crore could be invested in deploying **AeroPlast™ Shelters** for disaster-hit zones, benefiting thousands of vulnerable families.
- **Community Awareness:** ₹2 crore could support road safety and infrastructure awareness programs in hilly regions, covering more than 50,000 participants.
- **Sustainability Projects:** ₹2 crore could initiate pilot projects on reflective pavements and PhytoCivils™ systems in rural settlements, reducing heat stress and improving slope resilience.

These numbers illustrate how even modest financial surpluses, when ethically reinvested, generate **multipliers of social value**. Instead of concentrating financial gains within the consultancy, NCACI disperses benefits outward, creating stronger communities, empowered citizens, and more resilient infrastructure.

The 90 percent charity model also builds public trust. Clients engaging with NCACI understand that their investments are not only funding technical solutions but also indirectly strengthening social systems. This dual benefit creates a virtuous cycle where consultancy becomes a **driver of socio-economic transformation** rather than a purely commercial transaction.

Client as an Indirect Donor: Redefining Engagement

In conventional consultancy practice, the relationship between client and consultant is **purely transactional**. The client pays for services, and the consultant delivers technical outputs. Once

the project is complete, the engagement ends with no wider impact. While efficient, this model limits the role of the client to a consumer and the consultancy to a profit-driven service provider.

The **National Centre for Applied Civil Innovation (NCACI)** transforms this relationship by embedding its **90 percent charity reinvestment model** into every project cycle. Under this framework, the client's payment does not merely cover consultancy costs; it also becomes a vehicle for social contribution. By directing surplus funds into education, community programs, and humanitarian initiatives, NCACI ensures that every client is simultaneously acting as an **indirect donor** to society.

For instance, when a corporate body engages NCACI for slope stabilization of a 5 km hill road, the project fees generate a small surplus. Instead of retaining this surplus as profit, NCACI reinvests it into parallel initiatives: training 300 local students on slope safety techniques, deploying AeroPlast™ Shelters in disaster-prone villages, and publishing the project's findings as a DOI-assigned open-access study. Thus, while the corporate client receives its technical deliverables, it also becomes a silent partner in knowledge creation, capacity building, and humanitarian outreach.

This redefinition of client engagement has three major outcomes:

1. **Trust Building:** Clients see their funds transparently reinvested in society, strengthening long-term relationships.
2. **Shared Recognition:** Clients gain indirect recognition as contributors to sustainable and ethical initiatives.
3. **Societal Multipliers:** Each project creates both technical impact for the client and parallel social impact for communities.

In this way, NCACI demonstrates that consultancy does not have to end with service delivery. Instead, it can become a **dual-purpose mechanism** where the client benefits from technical expertise while simultaneously supporting societal transformation. This indirect donor model repositions consultancy as a bridge between private investment and public good, ensuring that development is both inclusive and ethical.

Global Collaboration Potential

In the contemporary era, no research or consultancy institution can operate in isolation. Civil engineering challenges such as climate adaptation, disaster resilience, and sustainable infrastructure are inherently global in nature, demanding cross-border collaboration. The **National Centre for Applied Civil Innovation (NCACI)** positions itself as a future-ready hub capable of fostering partnerships with diverse international stakeholders.

Academic Collaborations

NCACI's commitment to **open-access, DOI-assigned publications** ensures that its outputs are globally visible and citable. This transparency makes it a natural partner for universities and research institutions seeking to co-develop innovative frameworks. Collaborative projects may include joint research on reflective pavements for heat mitigation, bio-integrated PhytoCivils™ models for climate adaptation, or experimental studies on AeroPlast™ Shelters for disaster relief housing.

Governmental and Policy Collaborations

Governments worldwide face challenges in delivering sustainable infrastructure at scale. NCACI's **humanity-first consultancy framework** provides a replicable model for public policy experiments. For instance, international development agencies could adopt NCACI's approach in low-income or disaster-prone regions, where the **90 percent surplus reinvestment principle** directly aligns with community welfare objectives.

Industry Collaborations

The private sector is increasingly under pressure to demonstrate corporate social responsibility (CSR). By working with NCACI, industries can meet technical project requirements while simultaneously contributing to society. For example, a multinational corporation investing in NCACI's consultancy for infrastructure design would not only receive cutting-edge solutions but also become an indirect donor to educational and humanitarian programs.

NGO and Non-Profit Collaborations

Humanitarian organisations, particularly those involved in disaster management and rural development, often face resource constraints. NCACI's innovations such as **AeroPlast™ Shelters** and slope stabilization models provide scalable, cost-effective solutions. Partnerships with NGOs would ensure that these innovations reach vulnerable populations, strengthening the humanitarian impact of consultancy outputs.

Long-Term Global Role

Through such collaborations, NCACI aims to establish itself as a **global reference centre for ethical consultancy practice**. By offering a model that balances innovation, transparency, and humanitarian responsibility, NCACI provides a blueprint that can inspire other institutions worldwide. Its ability to combine technical consultancy with social reinvestment demonstrates a new paradigm of international cooperation, where knowledge and ethics transcend geographical boundaries.

Future Research Directions under NCACI

The **National Centre for Applied Civil Innovation (NCACI)** is not limited to its present set of frameworks; it is designed as an evolving institution that adapts to future challenges in civil engineering and societal development. The integration of **research, ethics, and humanitarian outcomes** requires continuous innovation. NCACI's future research roadmap includes both the refinement of existing models and the development of entirely new concepts.

Smart and Responsive Infrastructure

One future direction is the exploration of **smart pavements with thermal memory**. By embedding advanced materials capable of storing and releasing heat in a controlled manner, NCACI envisions pavements that adapt to climatic variations, mitigating urban heat islands and improving durability.

AI and Digital Integration

NCACI also plans to incorporate **AI-driven slope monitoring systems** for hilly terrains. These systems would employ sensors, drones, and predictive algorithms to provide real-time data on slope stability, enabling proactive interventions and reducing disaster risks in landslide-prone regions.

Bio-Integrated Urban Systems

Building on the PhytoCivils™ concept, NCACI aims to extend plant-based frameworks into **urban green infrastructure**. Bio-integrated parks, vertical greenery in cities, and climate-resilient vegetation networks could serve as natural buffers against flooding, air pollution, and heat stress, while simultaneously enhancing urban livability.

Humanitarian Engineering Solutions

The development of the **next generation of AeroPlast™ Shelters** is another priority. Future iterations will focus on modularity, energy integration (such as solar panels), and

water-harvesting features, ensuring that shelters are not only lightweight and deployable but also self-sustaining in disaster and refugee contexts.

Knowledge and Education Platforms

Finally, NCACI seeks to establish a **global open-access knowledge repository** where civil innovations, case studies, and field reports are shared without restriction. This initiative will ensure that research outcomes are not siloed but become part of a growing global commons of civil engineering knowledge.

Long-Term Research Outlook

By pursuing these directions, NCACI positions itself as a **living institution**—constantly evolving, innovating, and aligning research with societal needs. Its roadmap demonstrates that the future of consultancy is not static but dynamic, built on the principles of **adaptability, ethics, and service to humanity**.

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Author Notes

Author Contributions

- **Anil Kumar** contributed to the conceptualization of NCACI's research framework and provided academic insights drawn from his three decades of teaching and consultancy experience. He guided the structuring of innovative models such as slope stabilization strategies and reflective pavement systems.
- **Sonia Verma** contributed to the operational and financial dimensions of the NCACI model. Her expertise in finance, documentation, and strategic management ensured that the proposed framework integrated sustainability with ethical responsibility. She also played a key role in designing the humanity-first surplus reinvestment model.

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The authors declare no conflict of interest. The NCACI framework has been developed purely as a **conceptual and applied research model**, with no financial incentives sought by the authors. The primary objective is to highlight the possibility of integrating consultancy with ethical and humanitarian values.

Data Availability Statement

No primary datasets were generated or analysed during this study. All concepts presented are based on hypothetical modeling, literature review, and conceptual frameworks developed under NCACI.

